

3M™ Aluminum Conductor Composite Reinforced (ACCR)

More Amps,
More Confidence



3M ACCR

Integrated Energy Policy Report Workshop
Emerging Technologies for the Integration of Renewables
July 31, 2008





3M is a diversified technology company serving customers and communities with innovative products and services.

- *Worldwide sales: \$24.5 billion*
- *International sales: \$15.5 billion (63 percent)*
- *Products sold in nearly 200 countries*
- *Operations in more than 60 countries*
- *76,000 employees; 34,000 in the US*
- *Over 40,000 products*

Practical, ingenious solutions that help
customers succeed

California



3M in California

Total Employees/Retirees

3,511

(employees 2,074, retirees 1,437)

Total Payroll

\$139,694,788.88

Total Export Value

\$56,194,473

Number of Suppliers

2,694

Total Paid to Suppliers

\$1,314,931,091

State Income Taxes

\$17,026,000

State Charitable Contributions

\$805,087

April 2008



What is 3M™ ACCR?



- A high voltage, overhead transmission conductor...
- ...designed as a drop-in replacement for ACSR and ACSS on existing, thermally limited lines
- ...allowing utilities to use existing structures
- ...but capable of carrying 2 to 3 times the current.

If Your Upgrade Requires...

- A large capacity increase – up to 2 to 3 times the existing line
- Lengthy, costly, risky construction or rebuild project
- Structure modifications or replacements
- Challenging installations
- Quicker back to service, lower cost installation
- A highly reliable, proven solution

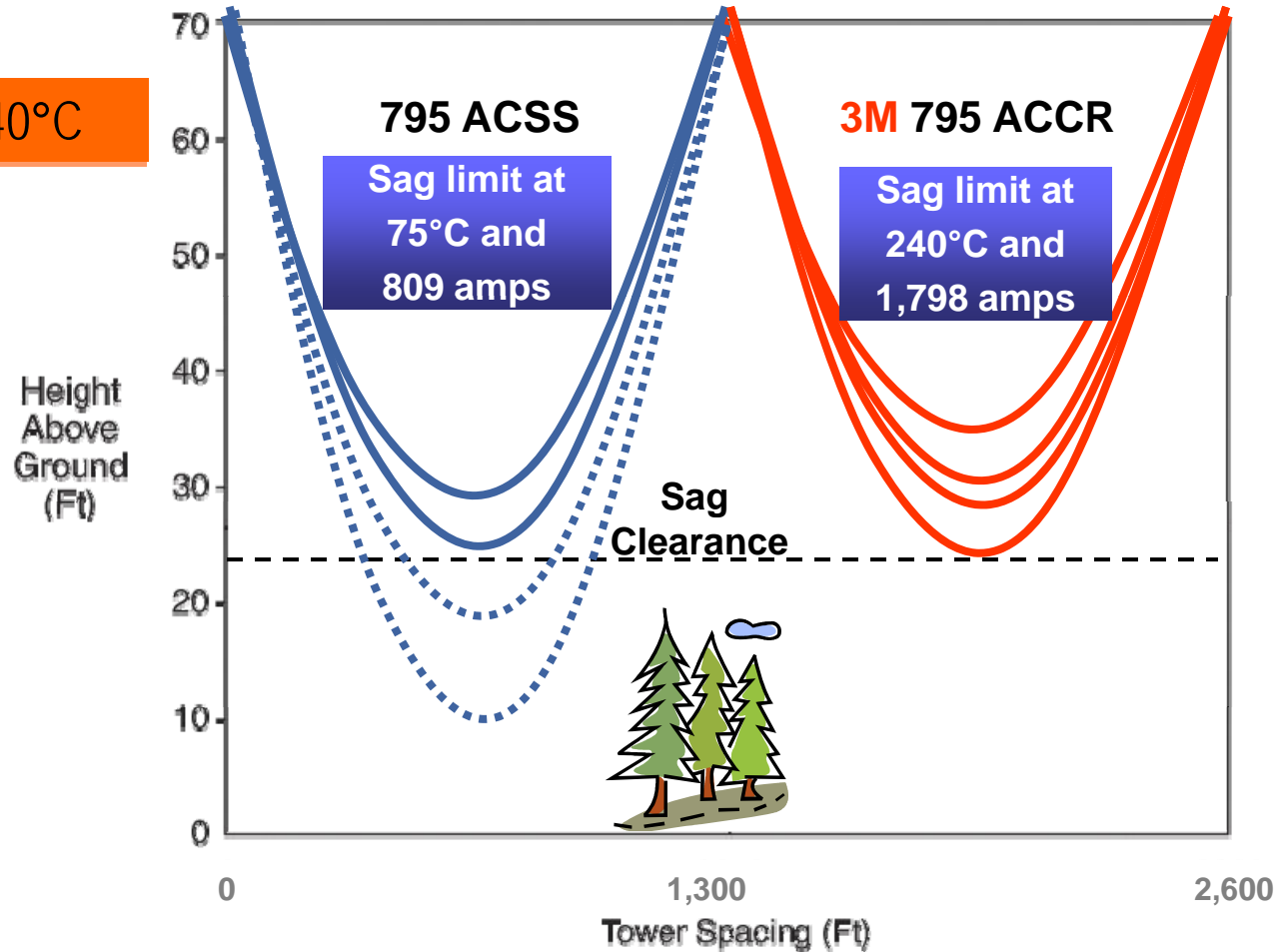


3M ACCR is your solution

3M ACCR – More Amps



240°C

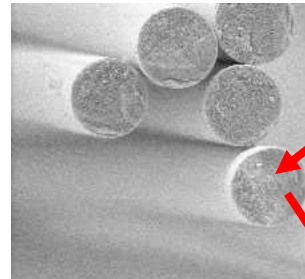


Assumes ACSS and 3M ACCR at 1,300 ruling span, initial tension 6,557 lbs @ 15° C, max. loading @ 30° F, no ice, 12 lbs wind; ambient conditions: 2f/s wind, 35° C, perpendicular wind direction, 0.5 emissivity and solar absorption.

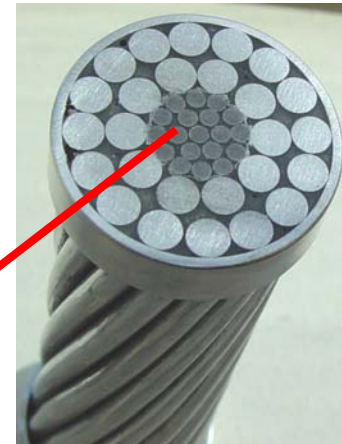
3M ACCR – More Amps, More Confidence

A breakthrough in materials science

- All aluminum-based
- Strong
- Light weight
- Low thermal expansion
- High modulus



Metal matrix (inorganic)



Aluminum-oxide fibers

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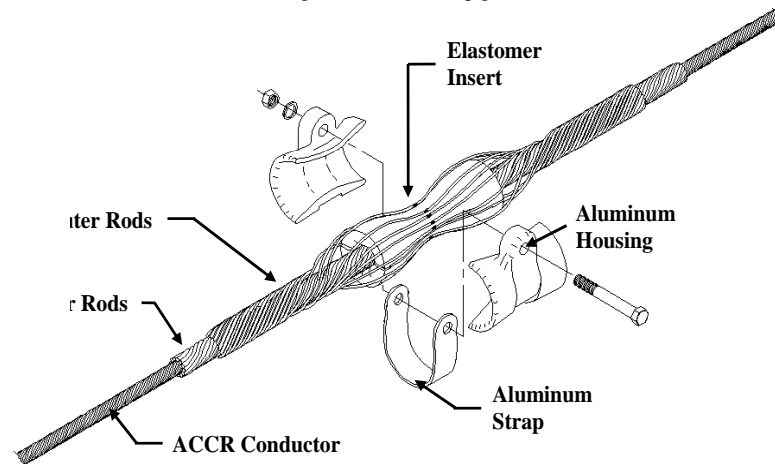
- Consistent performance at high temperatures
- Less sag due to heat from high energy loads
- Match with load, tension, clearance requirements
- Less stretching
- Corrosion resistance without barriers between core and outer wires
- Durability, with life expectancy of 40+ years, even at high temp operation
- Capacity increase up to 2 to 3 times the existing conductor
- Proven, reliable solution installed and in the field with no failures.



Easy to Use

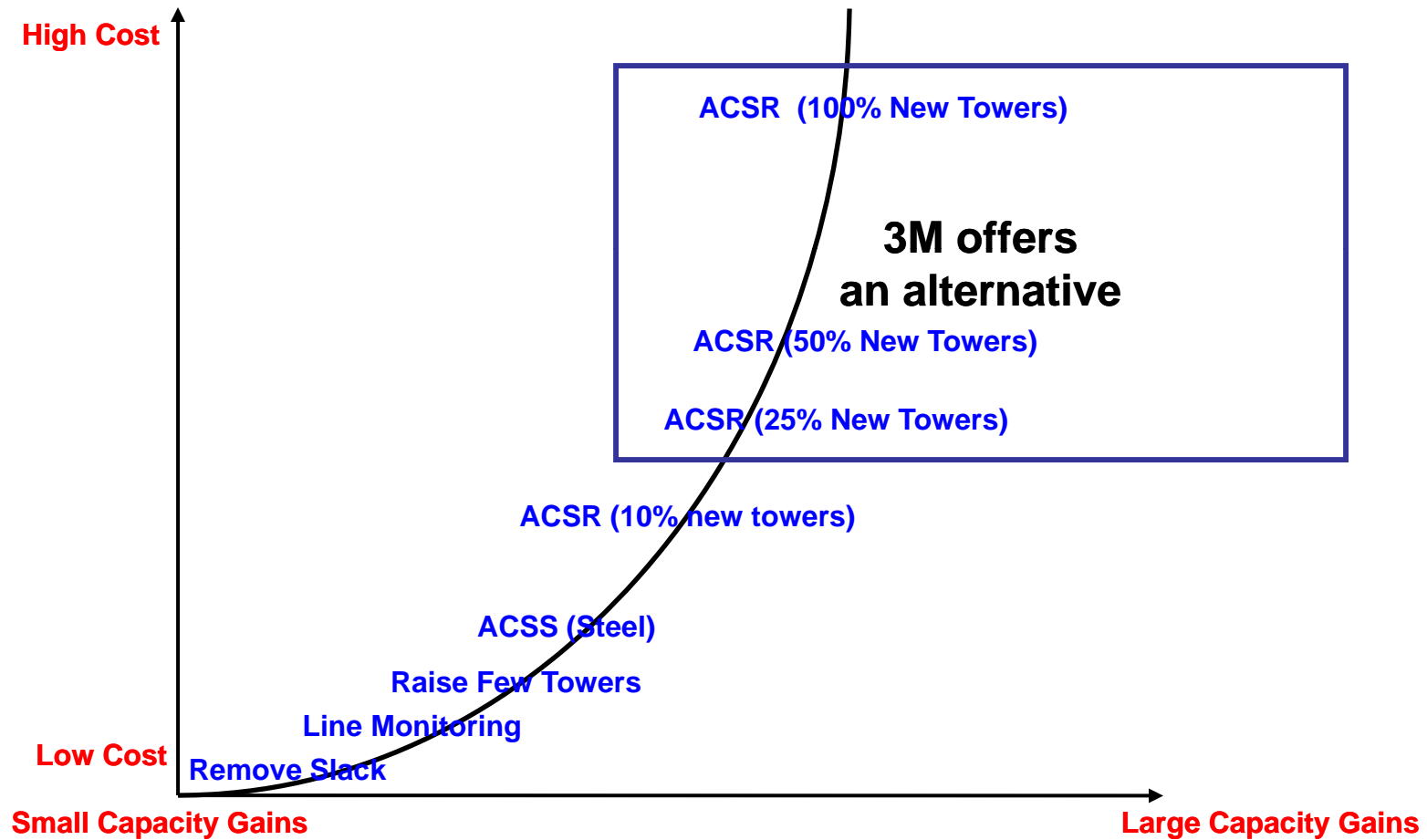


ACA Compression-Type Hardware



PLP Helical Rod-Type Hardware

Re-conductor, Rather than Rebuild



For Your Most Challenging Applications

Long span crossings and special siting situations

Eliminate taller towers or reduce the number of towers
Eliminate inter-set structures
Lessen environmental impact

Corrosive environments

Resist corrosion, even in coastal or high-pollution areas
No protective coatings required
Virtually no galvanic coupling

Changing clearance requirements

Roadway/waterway changes are less costly and faster

Densely populated or underbuilt areas

Quick, successful upgrade projects with minimal disruptions or additional land requirements



For Your Most Challenging Applications



Environmentally sensitive areas

Reduce land impacts
Avoid visual changes to the line

Heavy ice regions

High strength to weight ratios and a high modulus
are ideal for heavy mechanical loads
Increase reliability and safety

Aging structures

Lighter cables reduce the load
Get more value from existing assets -- towers last longer

Connecting New / Renewable Generation

Increase capacity on existing structures
Provide N-1 / G-1 contingencies



Maximize the Upgrade Value – Maximize the Amps



- Increase unit sales on existing assets – benefit ratepayers by spreading fixed costs over more kWh sales
- Greater reliability and more useable capacity – improve N-1 ratings on paths
- More flexibility and responsiveness – serve unexpected load growth, new generation, upgrades on other lines
- Delay the next upgrade – additional capacity can continue to serve growing loads longer
- Certainty of project costs and timing – reconductoring versus building

We're With You All The Way

- 100 Years in Business –
We will be here



3M



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